'An Advancing Hurricane'

a) model city as \((x - 240)^2 + (y - 200)^2 = 2500\)  

severe damage if: \((x - 240)^2 + (kx - 180)^2 = 2500\)  

thus, \((k^2 + 1)x^2 + (-480 - 360k)x + 87500 = 0\)  

Idea that no damage is done if this quadratic has no real roots thus,  

\[(-480 - 360k)^2 - 350000(k^2 + 1) < 0\]  

\[551k^2 - 864k + 299 > 0\]  

if \(551k^2 - 864k + 299 = 0\), \(k = \frac{432 \pm 25\sqrt{35}}{551}\)  

thus values of \(k\) satisfying inequality are \(k < \frac{432 - 25\sqrt{35}}{551}\) or \(k > \frac{432 + 25\sqrt{35}}{551}\)  

b) A suitable example such as, it doesn't consider the curvature of the earth, or it only accounts for a hurricane moving in a perfectly straight line.